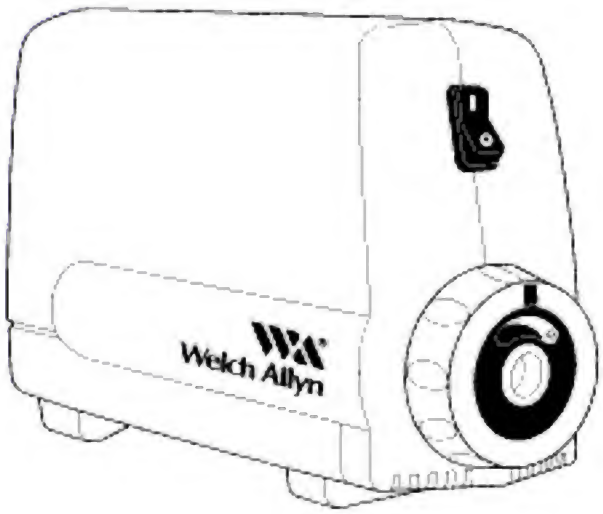
Welch Allyn Solarc
Light Source/Illuminator

Service Manual



Models: 49500,49502,49504,49506,
HLS-24-0,HLS-24-2,HLS-24-4,HLS24-6

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Welch Allyn Inc.
4341 State Street Road
P.O Box 220
Skaneateles Falls, NY 13153-0220

Welch Allyn™

P/N 495621 **Rev. B**

Revision (History) Page

Rev.	Description of Change	ECN #	Date	Initial
A	New Release	5-33806	10/10/96	JSJ
B	Update, Remove section revisions, replace fuse P/N	5-34456	1/14/97	JSJ/MD

To Service Personnel:

The information in this manual is subject to change without notice and should not be construed as a commitment by Welch Allyn, Inc.

Welch Allyn assumes no responsibility for any errors that may appear in this manual. If the product and/or its operation varies significantly from any description herein, please contact the Welch Allyn Product Service Department at 4341 State Street Road, Skaneateles Falls, New York 13153-0220, 1 800 669-9771, (315) 685-4445

This product has been designed to provide a high degree of safety and reliability. However, we can not guarantee against the deterioration of components due to aging and normal wear.

All service and repairs must be performed by authorized Welch Allyn personnel or agents, using Welch Allyn replacement parts. Failure to do so will invalidate the product warranty.

Authorized service centers should refer to repair specification for proper test and device history record requirements.

Please refer to the product warranty for specific coverage.

Welch Allyn™

Welch Allyn, Inc.
Medical Products
4341 State Street Road
Skaneateles Falls, New York 13153-0220
USA
1 800 669-9771
(315) 685-4445

Limited Warranty

49501Medical Light Source... Welch Allyn warrants the Welch Allyn Light Source when new, to be free of defects in material and workmanship and to perform in accordance with manufacture' specifications when subject to normal use and service for a period of ***three years*** from the date of purchase from Welch Allyn or an authorized agent. Welch Allyn will either repair or replace any components found to be defective or at variance from manufacture's specifications within this time at no cost to the customer. It shall be the purchaser's responsibility to return the instrument directly to the authorized distributor, agent, or service representative. This warranty does not cover the Solarc Lamp or breakage or failure due to tampering, misuse, neglect, accidents, improper installation, modification, shipping, or to improper maintenance, service, and cleaning procedures. This warranty is also void if the instrument is not used in accordance with manufacture's recommendations or if required or serviced by other than Welch Allyn or an authorized agent. Purchase date determines warranty requirements. No other express or implied warranty is given.

HLS24 Industrial Illuminator... Welch Allyn warrants the Welch Allyn Illuminator when new, to be free of defects in material and workmanship and to perform in accordance with manufacture' specifications when subject to normal use and service for a period of ***one year*** from the date of purchase from Welch Allyn or an authorized agent. Welch Allyn will either repair or replace any components found to be defective or at variance from manufacture's specifications within this time at no cost to the customer. It shall be the purchaser's responsibility to return the instrument directly to the authorized distributor, agent, or service representative. This warranty does not cover the Solarc Lamp or breakage or failure due to tampering, misuse, neglect, accidents, improper installation, modification, shipping, or to improper maintenance, service, and cleaning procedures. This warranty is also void if the instrument is not used in accordance with manufacture's recommendations or if required or serviced by other than Welch Allyn or an authorized agent. Purchase date determines warranty requirements. No other express or implied warranty is given.

For service assistance or questions regarding this warranty, please call Welch Allyn Medical Technical Service Department at 1 800 669-9771, or (315) 685-4445.

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APPENDIX A: Schematics/Diagrams

Table of Drawings (Appendix A)

Drawing Number	Description
N/A	Parts Lst/Recomended Inventory
495000	ACMI Light Box Asm
495064	Right Housing Asm
495072	Internal Chassis Asm
495078	Secondary Wire Harness Asm
495102	Interconnect Diagram
A03387	Illuminator Electrical Safety Test Secification

Drawings and specs are for reference only. Consult factory for current revisions.

Section 1

General Information

Basic System Description

Model # 49501 is a medical light source which is used in conjunction with several Welch Allyn medical instruments. This model has a built in Infrared filter to limit the heat generated by the light. It also has an external ferrite bead built into the power cord to meet Electromagnetic Interference (EMI) requirements, as required by medical standards.

Model HLS-24-0 is an industrial illuminator which can be used in many industrial applications. The HLS-24-0 is also known at Welch Allyn as a 49501I (The I indicates that the unit is for industrial use only). This instrument is identical to the 49501 medical light source with the deletion of the Infrared filter and the Ferrite bead.

49500....Welch Allyn Light Source
100-240 VAC
50/60 Hz
U.S.A. Plug Type

49502...Welch Allyn Light Source
100-240 VAC
50/60 Hz
European Plug Type

49504...Welch Allyn Light Source
100-240 VAC
50/60 Hz
U.K. Plug Type

49506...Welch Allyn Light Source
100-240 VAC
50/60 Hz
Australian Plug Type

HLS24-0...Welch Allyn Illuminator
100-240 VAC
50/60 Hz
U.S.A. Plug type

HLS24-2...Welch Allyn Illuminator
100-240 VAC
50/60 Hz
European Plug type

HLS24-4...Welch Allyn Illuminator
100-240 VAC
50/60 Hz
U.K. Plug type

HLS24-6...Welch Allyn Illuminator
100-240 VAC
50/60 Hz
Australian Plug Type

Specifications

Electrical

Input Voltage: 100-240 VAC, 50-60 Hz
Input Current: 1Amp (@ 100VAC)
Output: 60VDC @.4A
Leakage Current: Less than 100 microamps

Dimensions

HxWxD: 8.2" x 3.1" x 5.2" (21cm x 8cm x 13cm)
Weight: 2.5 Pounds

Illumination System

Welch Allyn HI-Lux Lamp
Color Temperature: 5500°K
Lamp: 60 Volts, 24 Watts
Lamp Life: 300 hours average

Dimming System

Manual Shutter: 20% to 100%

Fiber Optic Bundle Interface

Standard ACMI Connector

Approvals

UL 2601-1
CSA C22.2 No. 601.1-M90
IEC 601-1
IEC 601-1-2
CE
IEC 801-2,3,4,5
EN 55011
Australia AS3200

The CE mark on this product indicates it has been tested to and conforms with the provisions noted within the 93/42/EEC Medical Device Directive.

Declarations of Conformity are held by Welch Allyn's European Representative.

European Regulatory Manager
Welch Allyn Ltd.,
Kells Road, Navan,
County Meath, Republic of Ireland.
Tel +353 46 28122
Fax +353 46 28536

Environment

Operating: 60°F (15°C) to 85°F (30°C)
Storage: -13°F (-25° C) to 140°F (60°C)

Equipment Classification

Class 1, Type B, Continuous Operation

Fuses

T1.0A L250V: 1.0 A, 250 V, Time Lag (Slow-Blow), Low Breaking Capacity.

Section 2

Service

Intent of Manual

The purpose of this manual is to provide Welch Allyn Inc. authorized service representatives with systematic guidelines for preventative maintenance, problem identification, and service of the Solarc Light Source/Illuminator. We have included the theory of operation schematic diagrams, simplified drawings, service tips and procedures to assist a trained service representative with board-level repairs. Should you encounter problems that are beyond the scope of this manual, please contact the Technical Service Department of Welch Allyn's Medical Products for assistance.

Required Tools for Service

1. 11/32 Nut Driver
2. Screwdriver: Phillips #1
3. Long Nose Pliers
4. Wire Cutters Xcelite 54CG
5. 1/16" Drill bit and Pin-Vise

Required Equipment:

1. Digital Volt/Ohm Meter with Leads (True RMS). Beckman model 310 or equivalent.
2. Soldering Iron
3. Solder Sucker or Desoldering Wick
4. Kepco Model MSK 10-10M Power Supply. Capable of 10 amps at 10VDC.
5. Hy-Pot Tester- Associated Research Inc. Model 35400D or Equivalent.

Words of Caution:

High Voltage

Use caution when servicing. When servicing the unit, potentially dangerous high voltage levels are exposed. Disconnect the power cord whenever possible to avoid electric shock.

Static Electricity (ESD)

Adhere to standard ESD practices at all times when servicing this equipment. Many of the electronic devices in this equipment are static sensitive, and may suffer catastrophic or latent failure if handled improperly.

Heat

Lamps, power supplies, and heat sinks may emit extreme amounts of heat during and after operation. Approach and handle these and other potentially hot components with caution.

Finished Parts

Handle all finished parts with care. The finish can be easily scratched or damaged from poor or improper handling.

Performance Checks

The following performance checks will help you (1) determine whether or not the system is operating properly, and (2) isolates a problem, if there is one.

System Set Up

Make sure the system is connected as follows:

1. Be sure that power is being provided by the wall outlet.
2. Be sure that the Lamp is installed properly.
3. Be sure that the cooling fan is turning when the unit is turned on.
4. The light source should produce a bright continuous white light with no flickering after it reaches the steady state (approx. 15-20 Sec).

If any of these conditions do not occur, see the troubleshooting section.

Calibrations

Not Applicable

Section 3

Problem Solving

Troubleshooting

Experience shows that many service calls are due to improper operator technique and poor connections. Before taking apart the light source, make sure that setup errors are not causing the problem. **When checking voltages or signals, be sure to verify signal through the harness wires, connectors, and on the circuit board.**

Symptom	Possible Cause	Procedure
Lamp is not illuminated, and the fan is running.	Lamp connector is not connected well.	Remove lamp cover and re-seat connector.
	Lamp is blown.	Verify unit functions with a known good lamp or lamp functions with a known good unit.
	Defective ballast	Verify Voltage input and output of the Ballast board. Refer to wiring diagram. **Note: There is 1KV to 2KV present at the output during startup.**

Symptom	Possible Cause	Procedure
Lamp not illuminated, fan does not function (No power is apparent).	Power line damaged or disconnected.	Connect, repair, or replace as necessary.
	Power is not turned "ON"	Turn power on.
	Lamp Door Interlock switch is disengaged.	Verify that the lamp cover is firmly and properly in place and that interlock switch is functioning properly. Verify continuity to be sure that the switch is working properly.
	AC line fuses F1 and/or F2 are open.	Verify and replace as necessary.
	Open circuit connection.	Verify AC input through unit to the Switching Power Supply.
	Power supply circuit defective.	Verify DC output at J2 of Switching Power Supply.
	Other circuits loading down power supply.	If the fuse is blown, disconnect the plug from J2 (Output of the Switching Power Supply). Replace the blown fuse, and reapply power. Verify DC output at J2. If no voltage is present or fuse is again blown, replace Switching Power supply.
Light Source overheating	Fan Not working properly or blocked fan ventilation	Verify correct voltages at the input and output of the power supply *(See wiring diagram 495102)*. If all voltages are within specification, then replace motor/secondary wire harness assembly.

Section 4

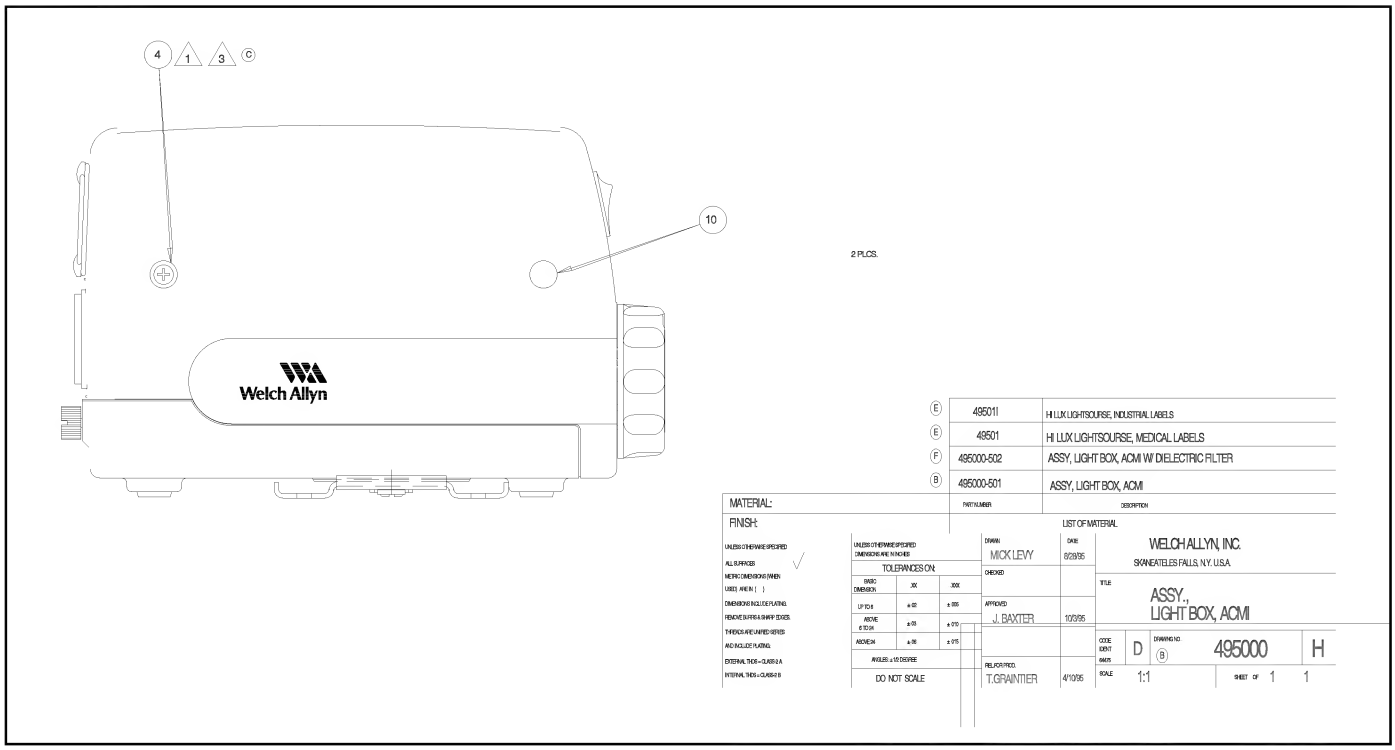
Disassembly and Repair

About This Section:

This section describes how to remove and replace major sub assemblies of the 49501 (Medical Version) and 40501I (Industrial Version) Solarc Light Source.

Note: Refer to the "Bubble Number" on each drawing and the cross reference on the Parts List to determine the correct part number.

Part Number	Description	Drawing #	Bubble #	Start up order Qty
106087	PHPS 6-32 X.500	495000	4	20
495080	PLUG, SCREW	495000	10	50



Left Housing Assy Disassembly

1. Remove the two screw plugs:

   ___**Drill** through the center of the plug with a 1/16 drill in a pin vise and pull straight up.

2. Remove the Bottom Housing:

   ___ **Loosen** thumb screw on the back of the unit and slide the assembly towards the back of the unit.

3. Lamp Replacement Label:

   ___ **Peel** off Label and discard.

4 Fan Guard:

   ___ **Unscrew** the two screws on the left side directly over the AC Power inlet that hold the fan guard in place. Only remove these two screws.

5. Light Attenuator Assembly:

   ___ **Unscrew** the two screws that hold Light Attenuator Control Assembly, and remove the pan head screw, that was under the attenuator control, from the left housing.

6. Left Housing Assembly:

   ___ **Unscrew** the two side screws that hold the right and left housings together. The left housing will now come off. Make sure to hold the switch and the AC power inlet down.

Ballast Board Replacement

1. Lamp:

   ___ **Remove** the lamp from the lamp holder, and disconnect the lamp socket.

2. Wire Tie:

   ___ **Cut** the tie wrap that holds the black and white wires that lead to the ballast board and lift the metal chassis off to one side.

3. Ballast PCB:

   ___ **Unscrew** the four Phillips head screws that hold the ballast board in place. Lift the board up and **unplug** secondary wire harness connector from the ballast board.

4. Lamp Wires:

   ___ **Desolder** the Black and White wires from the ballast board.

5. Reassembly:

   ___ **Reassemble** in reverse order taking care to not pinch any of the wires under the chassis plate. The chassis plate should be between the right housing and the insulator. Be sure to place the ballast board insulator in its original position.

Power Supply Replacement

1. Insulator Sheet:

   ___ **Pull** out insulator along side the PCB.

2. Wire Harness:

   ___ **Unplug** the secondary wire harness from the power supply PCB. It is the plug closest to the fan.

   ___ **Unplug** the primary wire connector and the green/yellow ground wire from the power supply board.

3. Reassembly:

   ___ **Reassemble** in reverse order. Be sure to put the insulator back into its original position. *Make sure* that the new power supply board is *seated* into the right housing.

Fan / Secondary Wire Harness Replacement

* The fan comes as part of the secondary wire harness assembly; therefore, the entire secondary wire harness assembly must be replaced.

1. Power Supply PCB:
   ___ **Remove** the power supply board and the ballast board as described in earlier in section 4 of this document. Do Not desolder the black and white wires from the ballast board as described in the ballast board section .

2. Fan/Fan Guard:
   ___ **Unscrew** the remaining two screws that hold the fan to the right housing. Taking care to remember how the ground wire is connected and routed.

3. Wire Tie:
   ___ **Cut** the wire tie that holds the secondary wiring harness to the Black & White wires leading from the ballast board.

4. Ground Wire:
   ___ **Unscrew** the top nut on the chassis ground stud, using an 11/32 nut driver, and lift off the top two ring terminals. See detail "A"of drawing 495072 for proper assembly of ground wires to the chassis ground stud.

5. Thermal Cut Off:
   ___ **Loosen** the screw that holds the temperature sensor to the lamp holder assembly, and remove the sensor.

6. Harness:
   ___ **Remove** the Secondary Wiring Harness assembly.

7. Reassembly:
   ___ **Reassemble** in reverse order. *(Note)* A small amount of *thermal compound* (M11047) needs to be *applied to* the flat side of the new temperature sensor before it is installed. See detail "A"of drawing 495072 for *proper assembly of ground wires* to the chassis ground stud. *Make sure* that the thermal cut out wire grommets are positioned properly.

Lamp Cover Safety Interlock Switch:

1. Safety Switch Assy:

   ___ **Unscrew** the two Phillips head screws that hold the switch assembly to the chassis. Keep the outside insulators.

2. Primary Wires:

   ___ **Disconnect** the primary wires from the switch, and remove the switch.

3. Reassembly:

   ___ **Reassemble** in reverse order. Make sure to reinstall the two insulators that were removed in step #1. Refer to wiring diagram for wiring of the switch.

Power Switch Replacement

1. Left Housing:

   ___ **Remove** left housing assembly as described in the left housing disassembly section.

2. Power Switch removal:

   ___ **Unplug** the four quick connect terminals from the switch and **remove** defective switch.

3. Power Switch replacement:

   ___ **Reassemble** the switch to the four quick connect terminals. The switch should be set into the right housing with the "0" closest to the internal chassis plate.

Replacement of the Primary Wiring Harness

1. Left Housing:
   ___ **Remove** left housing assembly as described earlier in sect. 4.

2. Wire Ties:
   ___ **Cut** the two wire ties that hold the harness to the internal chassis plate.

3. Ground Wire:
   ___ **Unscrew** the two nuts on the chassis ground lug using an 11/32 nut driver, and **remove** the primary ground wire.

4. Removal of the Interlock Switch:
   ___ **Unscrew** the two Phillips head screws that hold the interlock safety switch assembly to the chassis. Keep the outside insulators.

5. Removal of the defective wiring harness:
   ___ **Pull** off the quick connect terminals that attach the defective wiring harness to the power switch and to the interlock safety switch, Remove the defective wiring harness.

6. Reassembly of the primary wire harness assembly:
   ___ **Reassemble** in reverse order. Refer to wiring diagram for wire connections.

Section

5 Maintenance

Preventative Maintenance

The purpose of preventative maintenance is to pro-actively reduce or eliminate future problems. Keeping the Solarc Light Source in good operating condition ensures that it will perform reliably and safely. Every six to twelve months, you should:

* Check power cable for wear.

* Ensure that, during use, the light source receives adequate ventilation.

* Ensure that the ball detent is still functioning properly.

Visual Inspection

Check for anything out of the ordinary. For instance:

- Does the light source make too much noise?

- Are there any loose parts inside the box?

- Is the power switch working properly?

- Do all components connect/disconnect easily?

- Are the ventilation holes free of obstructions?

CLEANING

Refer to Operating Manual, Welch Allyn Part Number 495003.

Check Ground Continuity

1. Disconnect the power cord from the Solarc Light Source.

2. Verify the impedance between the ground pin of the IEC detachable ground cord and the thumb screw meets the requirements as outlined on drawing A03387 in Appendix. A).

Measuring Leakage Current

To check the Chassis Leakage Current:

1. Connect the light source to a leakage tester (refer to figure 5-1), and measure leakage current on leakage meter. Ensure that leakage is less than 100 microamperes.

2. Open ground line, and ensure leakage current is less than 100 microamperes.

3. Reverse line polarity, and ensure that leakage current is less than 100 microamperes.

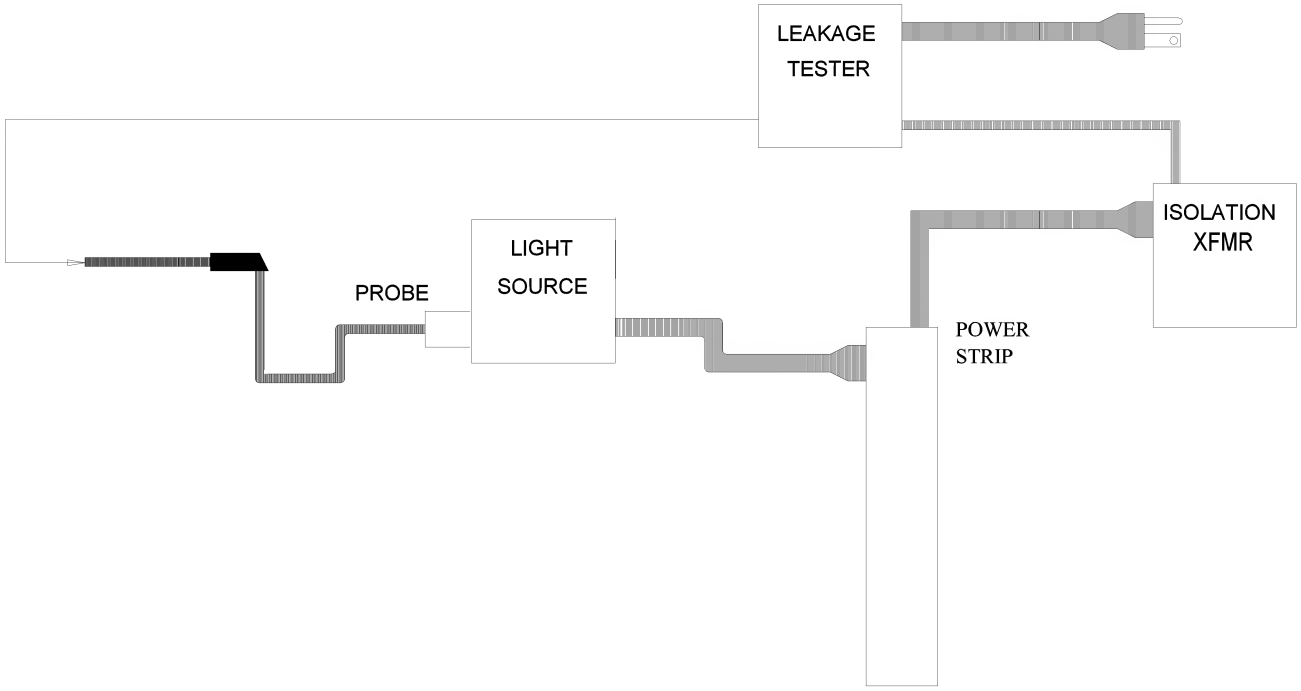
4. With reversed polarity, open ground line and ensure leakage is less than 100 microamperes.

CAUTION: The meter must be suitably insulated and capable of withstanding the power line voltage.

LEAKAGE CURRENT TEST SET-UP

When the light source is used in conjunction with other accessories, it may be necessary to measure the leakage current level of the entire set-up. A typical system setup is shown in Figure 5-1. Using a standard leakage tester, this set-up will allow the overall system leakage current to be measured. If this value exceeds 100 microamps (or whatever the maximum requirements are for a particular region), an isolation transformer should be used.

Figure 5-1: Typical Current Leakage Test Set-Up



FUSE REPLACEMENT

1. Turn the power switch OFF and disconnect the power cord from the light source.

2. Open fuse drawer located as part of the power cord receptacle.

3. Remove fuse by pulling it out firmly.

4. Check fuse condition. Replace if blown. Replacement fuse: 250V, 1.0 Amps. 5 x 20mm , Slow-Blow. ***Use WA fuse only! An unqualified fuse may fail prematurely.***

5. This system has two fuses. Be certain to check the condition of both fuses.

Fuse Replacement Figure 5-2

LAMP REPLACEMENT

Refer to users manual 495002 for full detail.

1. Turn the power switch OFF and disconnect the power cord from the light source.

2. Wait a minimum of 5 minutes to allow the lamp to cool.

3. Remove the lamp cover on the bottom of the Light Source by unscrewing the thumb screw on the back of the light source.

   NOTE: Removing the cover will automatically cut off power to the Light Source.

4. Slide black connector off the lamp.

5. Remove the lamp assembly by pulling against the spring action and pulling up.

6. Acquire new replacement lamp assembly.

7. Reseat the new lamp assembly. Be sure that the pin on the lamp is properly seated into the slot on the lamp bracket.

8. Slide black connector on to lamp.

9. Secure lamp cover.

10. Reconnect system to verify lamp operation and power interlock switch is closed.

Section 6

Theory of Operation

Introduction

Model # 49501 is a *medical light source* which is used in conjunction with several Welch Allyn medical instruments. This model has a built in Infrared filter to limit the heat generated by the light. It also has an external ferrite bead built into the power cord to meet Electromagnetic Interference (EMI) requirements. This light source should only be used by qualified medical personnel.

Model HLS-24-0 is an industrial illuminator which can be used in many industrial applications. The HLS-24-0 is also known at Welch Allyn as a 49501I (The I indicates that the unit is for industrial use only). This instrument is identical to the 49501 medical light source with the deletion of the Infrared filter and the Ferrite bead.

Start up Routine (Lamp Ignition)

Upon turning the power switch to the "ON" position lamp ballast will ignite the lamps for an approximate warm-up phase of 15 seconds. Once this warm-up phase is complete, the the lamps will be warmed up, and the system will be ready for use.
Note: The fiber bundle must be in place to stabilize light output. Do not toggle the power switch ON and OFF. Doing so will dramatically shorten lamp life. The lamp will not restart for 5-10 Seconds after power down.

Power Supply

UNIVERSAL INPUT, SWITCHING AC TO DC MEDICAL GRADE POWER SUPPLY

The power supply accepts an input voltage of 100-240 VAC, 50-60 Hz, single phase. The primary circuit provides adequate control of leakage current, which is limited to 35 microamperes maximum. The primary side of the power supply rectifies the AC voltage and converts it to a high voltage DC level. This DC voltage is connected to the isolation transformer through a switching device, typically a mosfet.

The mosfet is triggered by a high frequency clock circuit, typically at a 30-50 KHz rate. The secondary side of this transformer provides isolation between primary and secondary circuits. The secondary voltage is rectified and filtered to provide a +15 VDC output voltage at 5.3 amps. The output voltage is regulated to 2%, with peak-to-peak noise of 150mV. The output is fully protected against short circuit and output overload. Short circuit protection is a cycling type power limit with automatic recovery after fault.

Ballast Board

The ballast board is a power supply used to operate the 24 watt Welch Allyn miniature arc lamp. The nature of arc lamps require a ballast which limits the current, and therefore the power, in the lamp. There are three states of the operation of the ballast: ignition, warm-up, and steady state. In ignition the ballast provides the lamp with a train of ignition pulses between 6 and 7 kV. Once the lamp is ignited the ballast conducts current at a very low impedance, which constitutes the warm-up phase. Once it warms up, the impedance changes to a higher steady state value.

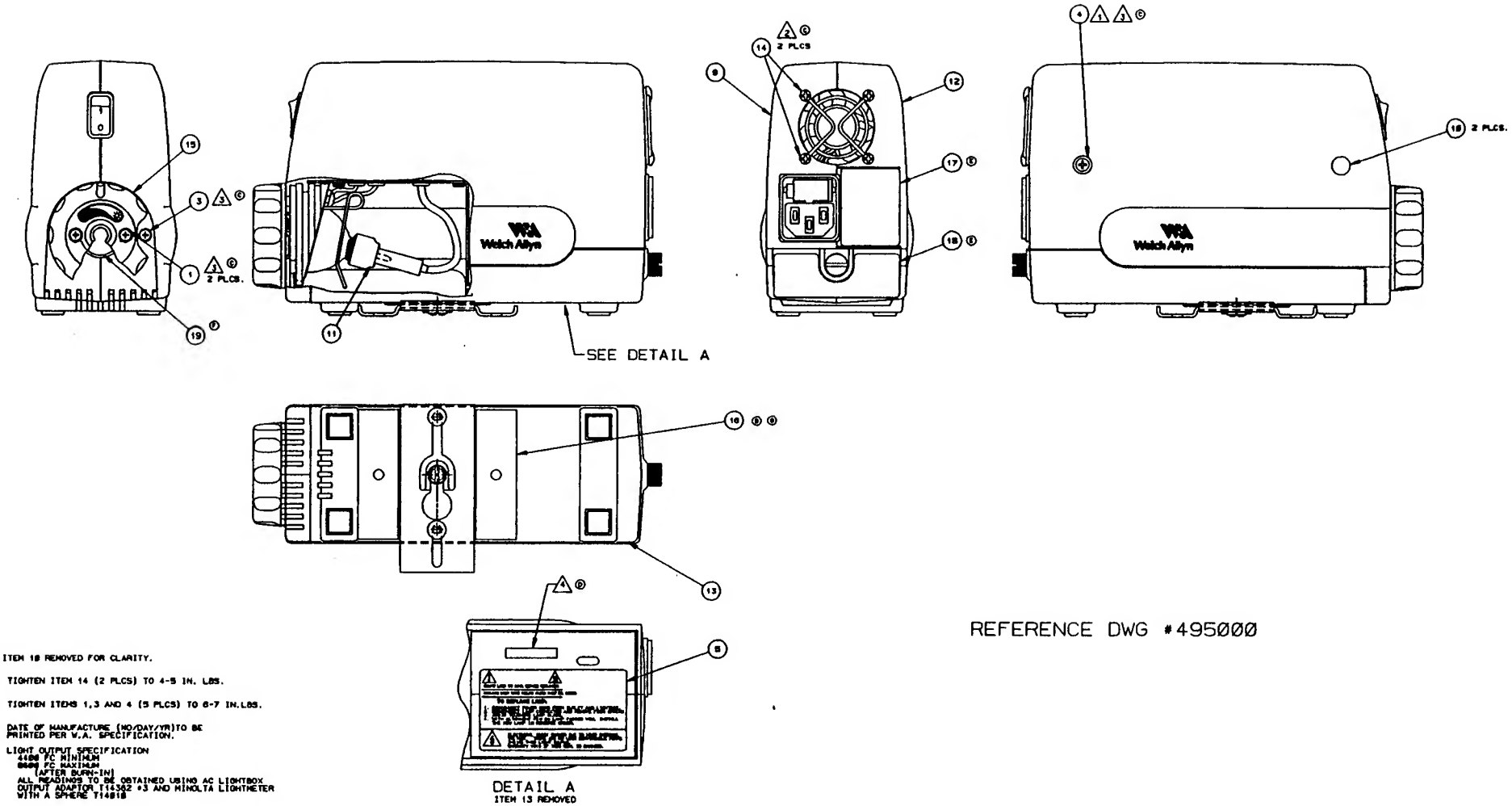
Appendix A

Parts List / Recommended Inventory

Part No.	Description	Drawing #	Bubble #	Rec. Inv.
106100-8	PHPS 6-32 X .63 LG	495000	1	20
106102-2	FHPS 4-40 X .375 LG	495000	3	20
106100-13	PHPS 6-32 X.500	495000	4	20
495059	LAMP REPLACEMENT LABEL	495000	5	25
495063-1	HOUSING, LEFT	495000	9	1
495080	PLUG, SCREW	495000	10	50
095100	LAMP, 24W MINIATURE ARC	495000	11	5
106132-5	4-40 X .750 PH TR MS SS	495000	14	10
495086-501	ACMI ATTENUATOR ASSY	495000	15	0
495055-502	MOUNTING BASE ASSY	495000	16	2
495061-1	LABEL, ETL W/CE	495000	17	5
495062-0	LABEL MODEL NUMBER	495000	18	5
495111	DIELECTRIC FILTER	495000	19	5
328043-1	RETAINING RING-LENS	495000	20	5
106106-2	#4 INTRNL TOOTH LKWSHR	495064	1	20
106103-27	FLAT WASHER	495064	2	20
790043	4-40 HEX NUT	495064	4	10
106102-2	FHPS 4-40 X .375 LG	495064	6	20
106124-13	#2 X 1/4 SCREW-PLASTITE	495064	7	20
495067	FAN GUARD	495064	8	0
495068	BALLAST 24W UNREGULATED	495064	10	5
880031	POWER SUPPLY 40 WATT	495064	11	5
495069-1	HOUSING, RIGHT	495064	15	1
495070	INSULATOR, POWER SUPPLY	495064	16	5
495071	INSULATOR, BALLAST	495064	17	5

Parts List / Recommended Inventory

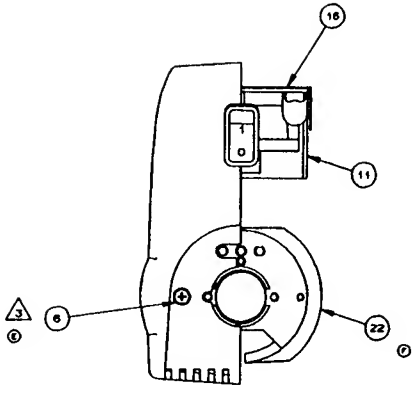
Part No.	Description	Drawing #	Bubble #	Rec. Inv.
495066	LAMP HOLDER	495064	22	0
106132-3	4-40 X 1" PH TR MS SS	495064	23	10
106132-5	4-40 X .750 PH TR MS SS	495064	24	10
M31426	.032DIA ENERGIZED ROSIN S	495064	25	1
106113-6	#4-40 SOCKET SET SCREW	495064	27	20
495065	LAMP SPRING	495064	28	0
M30373	LOCTITE 425 ASSURE THDLOC	495064	30	1
106132-4	6-32 X .3125 TRUSS HEAD SCREW	495064	31	10
495076	CHASSIS, INTERNAL	495072	1	0
455508	LABEL, PROTECTIVE EARTH Ground	495072	2	15
495073	GROMMET .126 ID X.06 X.25	495072	3	10
495077	PRIMARY WIRE HARNESS	495072	5	1
747187	#8-32 HEX-NUT	495072	8	10
483412	#8 EXTERNAL LOCKWASHER	495072	9	4
761077-1	TIE WRAP	495072	10	50
495074	INSULATING PLATE	495072	12	0
451534	SCREW PHP #4-40 X1.0	495072	13	20
495075	BALLAST SIDE CONN ASSY C1	495072	15	5
495078-1	SECONDARY WIRE HARNESS	495078	NA	1
488307-9	FUSE	NA	NA	20
495079-501	BOTTOM HOUSING ASSY	NA	NA	1

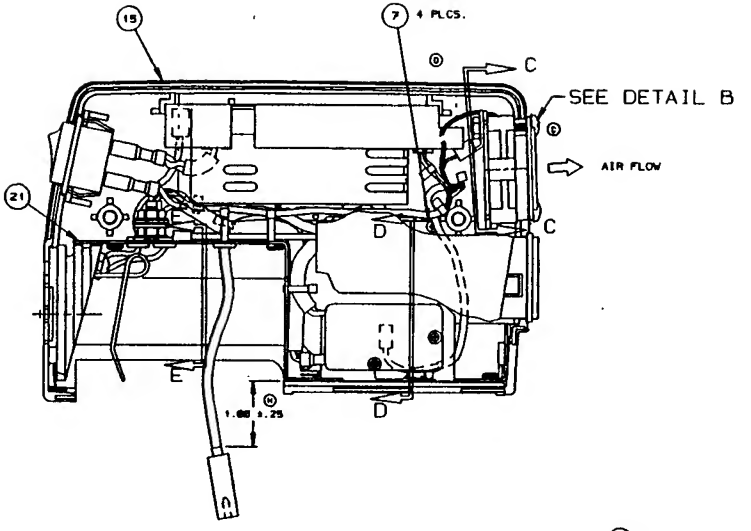


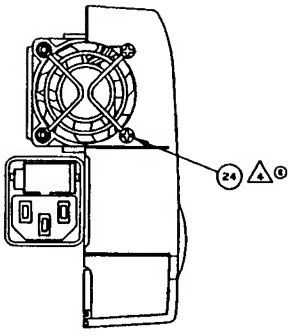
NOTES:

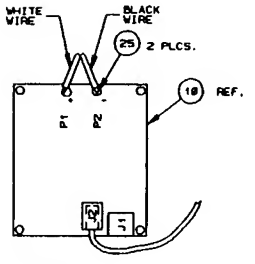
1. ITEM 18 REMOVED FOR CLARITY.
2. TIGHTEN ITEM 14 (2 PLCS) TO 4-5 IN. LBS.
3. TIGHTEN ITEMS 1,3 AND 4 (5 PLCS) TO 6-7 IN.LBS.
4. DATE OF MANUFACTURE (MO/DAY/YR)TO BE PRINTED PER W.A. SPECIFICATION.
5. LIGHT OUTPUT SPECIFICATION
   4100 FC MINIMUM
   6600 FC MAXIMUM
   (AFTER BURN-IN)
   ALL READINGS TO BE OBTAINED USING AC LIGHTBOX OUTPUT ADAPTOR T14362 #3 AND MINOLTA LIGHTMETER WITH A SPHERE T14818

REFERENCE DWG #495000

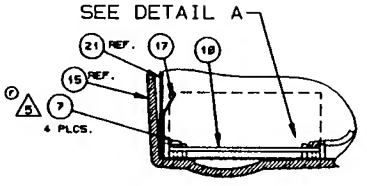




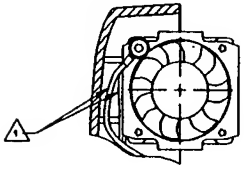




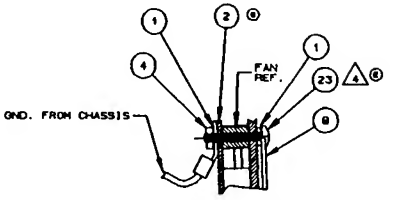
DETAIL A



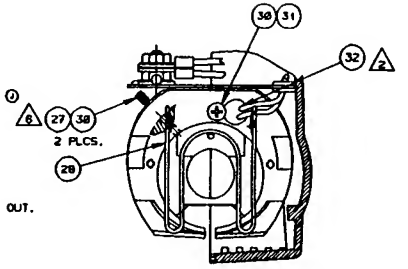
SECTION D-D



SECTION C-C



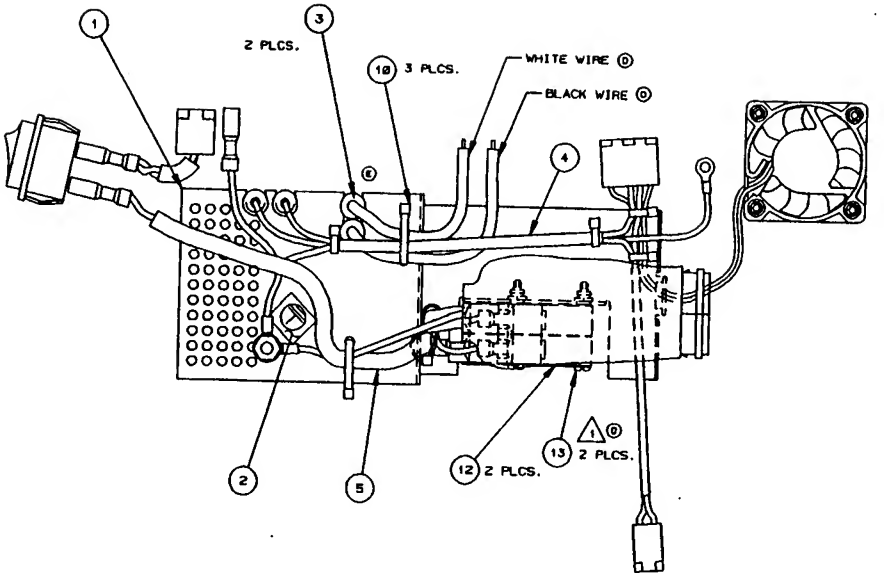
DETAIL B[6]

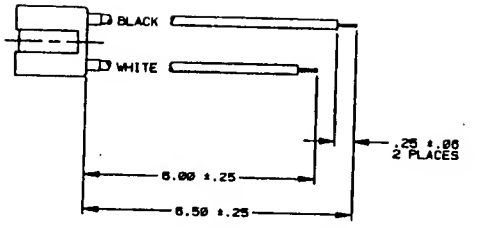


SECTION E-E

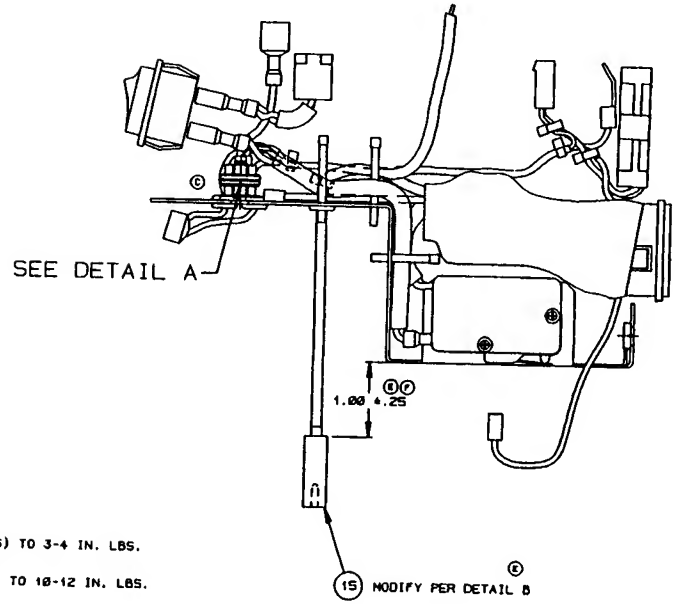
1. RING TERMINAL & FAN WIRES CAN NOT INTERFERE WITH OR BE IN THE AIR FLOW PATH OF THE FAN.
2. ITEM 32 TO BE APPLIED BETWEEN ITEM 22 AND THE THERMAL CUT OUT.
3. TIGHTEN ITEM 6 (1 PLC) TO 6 TO 7 IN. LBS.
4. TIGHTEN ITEMS 23 AND 24 TO 4 TO 5 IN. LBS.
5. TIGHTEN ITEM 7 (4 PLCS) TO 2.75 ± IN. LBS.

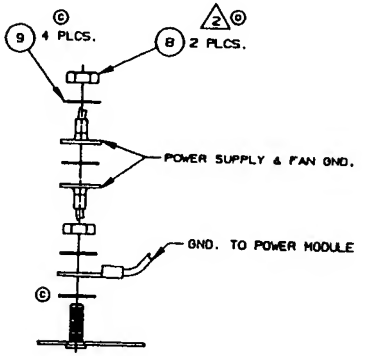
REFERENCE DWG #495570





DETAIL B ⓔ





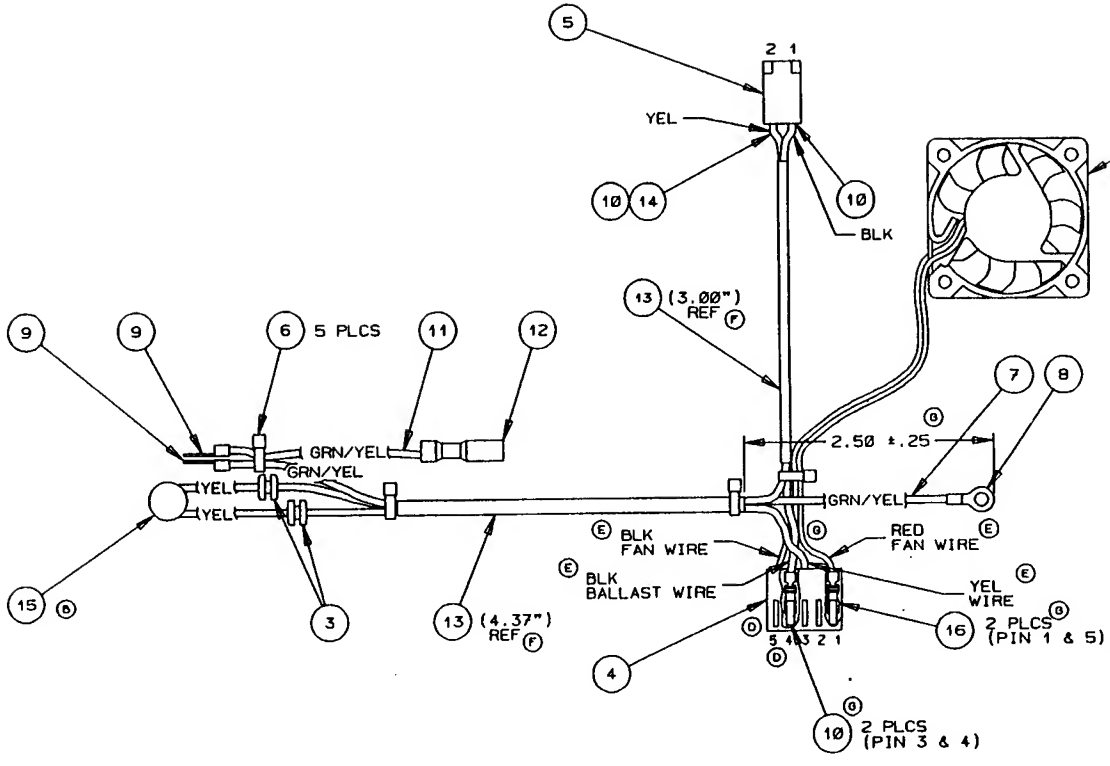
DETAIL A

REFERENCE DWG #495072

NOTES:

ⓓ 1. TIGHTEN ITEM 13 (2 PLCS) TO 3-4 IN. LBS.

ⓓ 2. TIGHTEN ITEM 8 (2 PLCS) TO 10-12 IN. LBS.



	QTY	PART NUMBER	DESCRIPTION
	LIST OF MATERIAL		
G	2	16	TERMINAL, CRIMP MOLEX 08-50-0133
BC	1	15	THERMAL CUTOUT THERMTROL B11-080A, B11 80C (±5) 12" LEADS
G	.458	14 ⚠1	WIRE, #18 AWG BLK,5.50X.12X.12 STRIP
F	.625	13	SHRINK TUBE .187 E.D.X.012W.D. RAYCHEM 1/4 VTW BLACK
	1	12	TERMINAL, RECEPTACLE SPADE AMP 2-520405-2
GC	1	11 ⚠1	WIRE #18 GA GRN/YEL 2.75 L X .25 X .25 STRIP
GE	4	10	TERMINAL, CRIMP MOLEX 08-52-0071 OR EQUIV
C	2	9	RING, TERMINAL#8, AMP 320554 OR EQUIV
EC	1	8	TERMINAL, #4 INSULATED RING, P/N AMP 320882 OR 2-320882-1
GD	1	7 ⚠1	WIRE#18 AWG GRN/YEL, 8.50 X .25 X.25 STRIP
G	4	6	TIE WIRE, TYTON T18R-9 OR EQUIV
	1	5	HOUSING, 2 POS MOLEX 09-50-8023
	1	4	HOUSING, 5 PIN CT MOLEX 09-50-8051
	2	3	GROMMET, ATLANTIC INDIA RUBBER CO. 54-G, 26012 BUNA S60 DUR BLK
J			
H	1	1	FAN, / SUNON KDE1204PFB2-8

C

NOTES:

⚠1 WIRE SPECIFICATIONS:

TYPE U.L.1015,CSA TEW 105.

COLOR CODED .032 THK. (NOM) PVC INSULATION.

TEMP RANGE: -20°C TO +105°C

VOLTAGE RATING: 600V

STRANDED TINNED COPPER CONDUCTOR

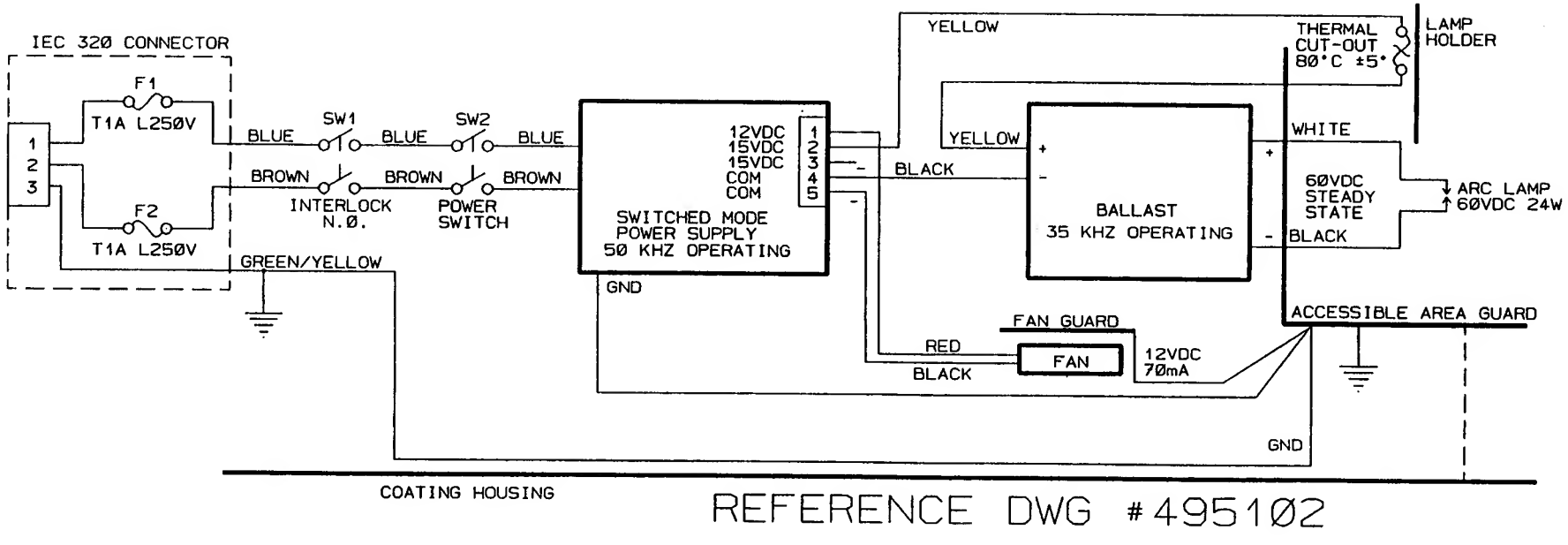
RECOGNIZED COMPONENT MARK RU AND CSA MUST APPEAR OR BE STAMPED ON WIRE.

G ⚠2 FUNCTIONAL TEST:

FAN MUST PASS 10 CONSECUTIVE ON/OFF STARTS AT 12.0 VDC.

G 3. ALL CRIMP TERMINALS MUST BE DOUBLE CRIMPED.

REFERENCE DWG #495078



REFERENCE DWG #495102

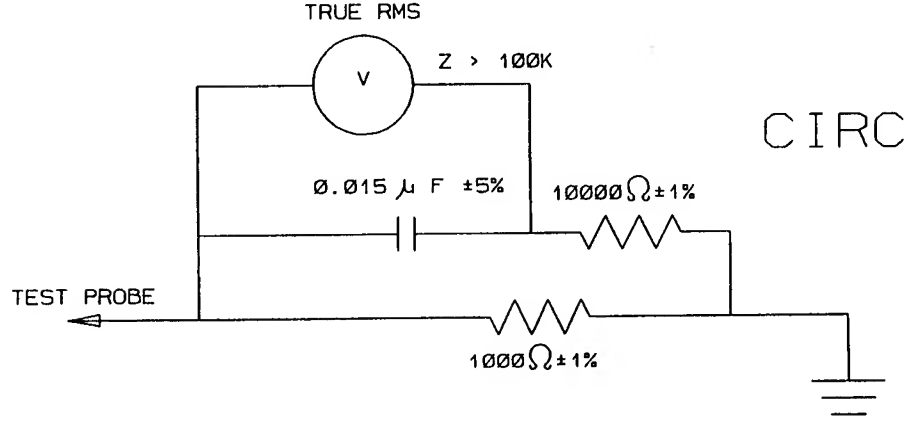
AT THE CONCLUSION OF MANUFACTURE AND BEFORE SHIPMENT, EACH WA ILLUMINATOR UNIT SHALL SUBJECTED TO THE FOLLOWING TESTS:

Ⓒ 1 - A DIELECTRIC STRENGTH TEST OF 1500 VAC FOR 1 SECOND BETWEEN PRIMARY WIRING (BOTH SIDES OF SUPPLY TERMINALS CONNECTED TOGETHER) AND ACCESSIBLE DEAD METAL PARTS (THUMB SCREW).

Ⓑ 2 -THE LEAKAGE CURRENT MEASURED FROM ANY EXPOSED METAL PARTS (THUMB SCREW) TO GROUND WITH AN INPUT VOLTAGE OF 240V, 50HZ AND THE GROUND WIRES SECURELY CONNECTED SHALL NOT EXCEED 100 MICROAMPS (CIRCUIT #1 BELOW).

Ⓑ 3 -GROUND CONTINUITY BETWEEN GROUND PIN OF IEC DETACHABLE LINE CORD AND THUMB SCREW SHALL NOT EXCEED 0.2 OHM. A CURRENT OF 1 AMP FROM A CURRENT SOURCE WITH A NO-LOAD VOLTAGE NOT EXCEEDING 6 VOLTS WILL BE PASSED BETWEEN THEM FOR AT LEAST 5 SECONDS AND THE RESISTANCE CALCULATED FROM THE CURRENT AND THIS VOLTAGE DROP.

4 - IF ANY OF THE TOLERANCES HAVE BEEN EXCEEDED, THE UNIT SHALL BE REJECTED.



CIRCUIT #1

REFERENCE DWG #A03387